Flow Management Issues in the Delaware River Basin

An Interesting and Unique History

The Catskill Mountain region of the upper Delaware River Basin in New York State, which is approximately 100 miles from the New York City (NYC) metropolitan area, provides the city with more than half of its water. The water is stored and transported to NYC, which lies outside of the basin, through a system of city-owned reservoirs and aqueducts. The downstream states – Pennsylvania, New Jersey, and Delaware – also rely heavily on the waters of the Delaware. Throughout its entire length, the Delaware River provides valuable habitat and is an outstanding recreational resource. Trout Unlimited has estimated that river-related recreational activity in the upper Delaware resulting from the world-class, coldwater fisheries created by releases from three large NYC reservoirs generates some $30 million per year for the local economy. These multiple demands have led to intense competition for the waters of the Delaware.

The U.S. Supreme Court issued a decree in 1931, which was amended in 1954, to resolve an interstate dispute over the allocation of water in the Delaware River Basin. The 1954 amended decree increased the allowable diversion by NYC to an average of up to 800 million gallons per day (mgd) from its three in-basin reservoirs (Cannonsville, Pepacton, and Neversink). However, this was conditioned on the city releasing enough water from these reservoirs to maintain a minimum flow rate of 1,750 cubic feet per second (cfs) in the Delaware River at Montague, N.J. This is commonly referred to as the "streamflow objective" at Montague. The 1954 amended decree also authorized New Jersey to divert an average of 100 mgd from the Delaware Basin to the Raritan River Basin through the Delaware and Raritan Canal. The nation's highest court gave the responsibility of ensuring that the provisions of its 1954 decree are met to an official in the U.S. Geological Survey known as the Delaware River Master.

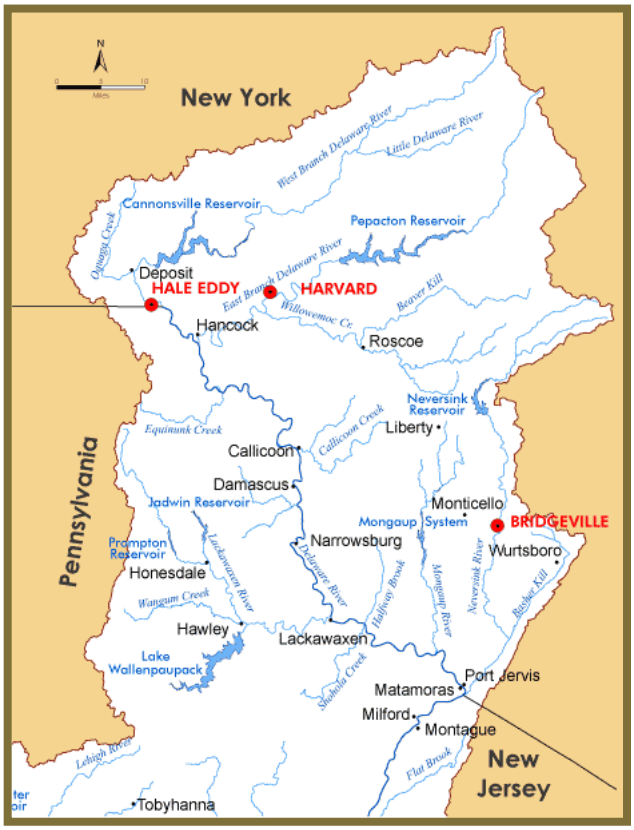
The DRBC, a federal-interstate compact agency, consists of the governors (or their alternates) from each of the four basin states and a federal representative. In contrast, the decree party representatives are the governors (or their alternates) from the four basin states and the mayor (or designated alternate) from NYC.

The compact creating the DRBC provided it with the unique authority to adjust the 1954 decree ***conditioned on the unanimous consent of the decree parties,*** and the commission has exercised this power on numerous occasions. The most significant of these adjustments resulted from the implementation of the "Good Faith Agreement" in the early 1980s that included the DRBC drought operating plans. These operating plans were prompted by a record drought in the 1960s and were made to conserve storage and ensure adequate minimum flows during a repetition of such conditions.

The Challenge

The three NYC reservoirs in the upper Delaware were built by the city for water supply. The U.S. Supreme Court's 1954 decree required releases from the reservoirs to meet the Montague minimum flow objective, but did not require minimum releases to protect fisheries in tailwaters downstream of the dams.

Over the past 25 years, the New York State Department of Environmental Conservation (NYSDEC) has taken the lead in studying the fisheries and proposing release schedules to protect them, but the legal setting is quite complex. While the commission has the authority to adjust the operating rules of the decree, the DRBC cannot unilaterally dictate increased fishery releases to the city because there must be unanimous consent among all of the decree parties. As a result, the DRBC



This map of the upper Delaware River Basin highlights in red the location of the three proposed minimum flow targets for fishery protection.

serves the critical role of providing a forum for the decree parties to negotiate improved fishery releases.

Commission staff spent considerable time and effort throughout 2002 and 2003 to support the work of its advisory committees and stakeholders to re-examine flow allocation in the upper Delaware region, considering water supply, the down-basin states' needs, and the needs of fisheries in the upper basin.

Here are some of the major developments that took place during 2002 and 2003:

New Experimental Flow Target for Fisheries Protection on the West Branch

While continuing the ongoing process of negotiating a permanent fisheries release program more responsive to the water conditions downstream of the NYC Delaware Basin reservoirs, the commissioners in April 2002 approved a resolution establishing an experimental flow target of 225 cfs during normal conditions at Hale Eddy, N.Y. on the West Branch of the Delaware. This action, which was unanimously agreed to by the decree parties, was the first time that a flow target was put into effect for fisheries protection in the tailwaters below the NYC reservoirs. The releases would come from a "habitat bank" of water set aside for this purpose, which consisted of about 3.8 billion gallons (bg). The resolution further stipulated that this flow target would be reduced during drought watch and warning operations, and be suspended during drought emergencies. The commissioners at their March 2003 meeting, with NYC's concurrence, extended this temporary program through April 30, 2004 to allow for additional time to reach a longer term fisheries agreement.

The DRBC serves the critical role of providing a forum for the decree parties to negotiate improved fishery releases.

Proposed Three-Year Interim Fishery Management Plan

The commission's Flow Management Technical Advisory Committee and the decree parties spent much of 2003 reviewing a proposal by NYSDEC for a three-year interim fishery management plan that would extend from May 1, 2004 through May 31, 2007 while discussions continue toward development of a long-term flexible reservoir release program. Although the exact wording had still not been finalized by the end of 2003, the key point of the proposal included the establishment of minimum flow targets during normal conditions below all three NYC reservoirs: on the East Branch of the Delaware at Harvard, N.Y. and on the Neversink River at Bridgeville, N.Y., in addition to Hale Eddy on the West Branch. Reduced minimum flow targets would be in effect during drought watch, warning, and emergency operations. Another major element of the three-year plan would be an available bank of water totaling approximately 13.3 bg (20,000 cfs-days) from the NYC reservoirs to be used to maintain the three targets and control water temperatures so they are suitable for the coldwater fisheries. This interim plan would allow for more flexible use of water storage designed for fishery protection with priority given to thermal protection since the trout can be threatened when water temperatures are too high. The interim plan also includes provisions to allow thermal releases during drought operations, which was previously unavailable.

It is hoped that this proposal will be considered by the commissioners and the decree parties for approval in April 2004.

Revisions to Lake Wallenpaupack's Drought Operating Plan

A revised drought operating plan for Lake Wallenpaupack, owned and operated by PPL, complements the three-year interim fishery plan now under consideration by the commission and the decree parties. The plan would provide an additional 4 bg of water to be used at the commission's discretion during drought watch, warning, and emergency operations to meet the flow targets on the Delaware River. In return, PPL would receive a credit of up to 3 bg toward satisfaction of the DRBC's consumptive use replacement requirements (the commission requires power

generating stations during droughts to make up for the tremendous amounts of water they use that evaporates, or face cutbacks to their power operations). Modeling has shown that the implementation of the PPL plan allows for the increased fishery protection releases under the proposed interim fishery plan while lowering the frequency of conditions triggering the various drought operations that are based on combined NYC reservoir storage.

This proposed revision will not go into effect unless the proposed three-year interim fishery management plan also is adopted by the commission and the decree parties.

OASIS Flow Model

All of the computer flow modeling associated with the NYSDEC fishery proposal development and the PPL drought operating plan revision was conducted by multiple parties using a new daily flow model with the trade name OASIS, developed as part of a recent flow management study paid for by the DRBC at a cost of $400,000. A report on that study, which identifies flow-related issues of the basin's regulated streams and suggests approaches to provide better information to resolve the issues, is in the last stages of review by the decree parties.

In-Stream Flow Needs

The commissioners in September 2003 unanimously approved a resolution recognizing and supporting the use of a formal process for developing and evaluating the feasibility of achieving flow targets to address instream flow and freshwater inflow requirements for aquatic ecosystems in the Delaware River Basin. The commission and the decree parties committed to participating in this non-binding collaborative process to develop experimental flow management options for the Delaware River and its regulated tributaries. Furthermore, the resolution recognized a new subcommittee of the commission's Flow Management Technical Advisory Committee — known as the *Subcommittee on Ecological Flows (SEF)* — to incorporate its expertise in aquatic ecology to develop the ecological basis for in-stream flow requirements throughout the basin. This subcommittee, which met in October and December, is chaired by Colin Apse of the Nature Conservancy.

Cannonsville Reservoir on the West Branch of the Delaware. *(Photo by Rick Fromuth)*

Dwarf Wedgemussel

Most recently, DRBC staff, agency partners, and stakeholders have been assessing the significance of the Endangered Species Act on upper Delaware flow management initiatives in light of the presence of the dwarf wedgemussel, a federally listed endangered species. The question to be answered is, "What flow criterion is needed to protect the species?" Flow management policy would then be considered to meet this criterion.

For more information about flow management and other hydrologic issues, please visit the DRBC web site at http://www.nj.gov/drbc/hydro.htm.